SEQUENCE LISTING

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     True, Thom
     Simmons, Carl R.
     Yalpani, Nasser
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<151> 2003-03-14
<150> 10/290,086
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<150> 60/420,666
<151> 2002-10-22
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                                  10
Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser Gly Pro
                              25
40
                                              45
Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe
                       55
                                          60
Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe
                   70
                                      75
Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Asn Ala Tyr Pro Gly Phe
               85
                                  90
Ala His Gly Gly Thr Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe
           100
                              105
Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu
                           120
                                              125
Ile Asn Lys Ser Asn Ala Tyr Cys Asp Ala Ser Asn Arg Gln Trp Pro
                       135
Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser
                   150
                                      155
Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Asp Ile Gly Phe Asn Gly
               165
                                   170
Leu Ala Asp Pro Asn Arg Val Ala Gln Asp Ala Val Ile Ala Phe Lys
                               185
Thr Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro Gln
                           200
                                              205
Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn
```

220

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230
                                        235
Tyr Cys Gln Gln Leu Arg Val Asp Pro Gly Pro Asn Leu Thr Cys
                                    250
<210> 2
<211> 248
<212> PRT
<213> Zea mays
<400> 2
Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe Gly Tyr
                                   10
Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser Gly Pro
Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala Asn Val
Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser Gln Ala
Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe Leu
Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser Gln Val
                                    90
Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr His Glu
                                105
Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala Tyr
                            120
Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys Tyr
                        135
Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro
                    150
                                        155
Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly Arg Val
                165
                                    170
                                                        175
Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe Trp Met
                                185
Asn Ser Val His Gly Val Val Pro Gln Gly Phe Gly Ala Thr Thr Arg
                            200
Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala Gln Met
                        215
                                            220
Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln Leu Gly Val
                    230
Asp Pro Gly Pro Asn Leu Thr Cys
                245
<210> 3
<211> 777
<212> DNA
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1)...(777)
<400> 3
teg atg cag aac tge gge tge cag eea aac tte tge tge age aag tte
                                                                   48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
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Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln

	tac Tyr					-	_								_	96
	ccg Pro	_	_	_												144
	gga Gly 50															192
	ttc Phe				_		_	_		_		_			_	240
65					70					75					80	
	ttc Phe				_			_	_	_	_	_				288
	ttc Phe															336
	ttc Phe															384
	gag Glu 130															432
	tgg Trp															480
cag Gln	atc Ile	tcc Ser	tgg Trp	aac Asn 165	ttc Phe	aac Asn	tac Tyr	gly aaa	ccc Pro 170	gcg Ala	Gly 999	agg Arg	gcc Ala	atc Ile 175	ggc Gly	528
	gac Asp															576
	ttc Phe	_		_					_		_					624
	ccg Pro 210	_				_				_				_		672
-	tgc Cys						_	_	_			_	_			720
	aag Lys	_		_	_	_		_	_	_						768
act	tgc	tag														777

Thr Cys * <210> 4 <211> 258 <212> PRT <213> Artificial Sequence <220> <223> Variant sequence produced by shuffling techniques <400> 4 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys 75 Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro 90 Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala 105 Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile 120 Asn Glu Ile Asp Gly Pro Ser Lys Asn Tyr Cys Asp Arg Asn Asn Thr 135 140 Gln Trp Pro Cys Gln Ala Gly Lys Gly Tyr Tyr Gly Arg Gly Pro Leu 150 155 Gln Ile Ser Trp Asn Phe Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly 165 170 Phe Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val 180 185 Ala Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val 200 Met Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu 215 Glu Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr 230 235 Tyr Lys Gln Tyr Cys Gln Gln Leu Arg Val Asp Pro Gly Pro Asn Leu 245 250 Thr Cys <210> 5 <211> 756 <212> DNA <213> Artificial Sequence

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<210> 5
<211> 756
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1)...(756)
<400> 5
tcg atg cag aac tgc ggc tgc gcg tcg ggc ctg tgc tgc agc cgg ttc
Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
```

48

1				5					10					15		
		_		_		_	_				gac Asp				_	96
											ggc Gly					144
		_	_	_	_						aac Asn 60			_	_	192
											tac Tyr					240
	_	_	_	_	_						gcc Ala				_	288
				_	_			_	_		ttc Phe			_	_	336
											atc Ile					384
_			_	_				_	_		ccg Pro 140	_	_			432
											tcg Ser					480
						-				_	gly aaa			_		528
					_	_			_		aag Lys		_			576
		_	_		_		_		_		cag Gln				_	624
											aac Asn 220					672
_		_			_	_					cag Gln		_	_	_	720
		_	_	ccg Pro 245						_	tga *					756

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<210> 6
<211> 251
<212> PRT
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<400> 6
Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
                            40
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                    90
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
                                105
His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asp Gly Pro Ser
                            120
                                                 125
Lys Asn Tyr Cys Asp Arg Asn Asn Thr Gln Trp Pro Cys Gln Ala Gly
                        135
                                            140
Lys Gly Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn
                    150
                                        155
Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro
                165
                                    170
Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp
            180
                                185
Phe Trp Met Lys Asn Met His Gln Leu Met Pro Gln Gly Phe Gly Ala
        195
                            200
Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro
                        215
Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln
                    230
                                        235
Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys
                245
<210> 7
<211> 774
<212> DNA
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1) ... (774)
<400> 7
teg atg cag aac tge gge tge cag ceg aac gta tge tge age aag ttt
                                                                   48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg
                                                                   96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
```

	_	_	-								ggc Gly			 	144
									-		gtc Val 60	-			192
					_	_	_	_		_	Gly 999	_	_	 _	240
					_			_	_	_	gtc Val			_	288
											aag Lys				336
											cat His				384
											gcg Ala 140				432
											cgc Arg				480
	_							_			agg Arg	_			528
											agc Ser				576
	_							_			gtg Val			 	624
_					_				_		aac Asn 220		_		672
											cgc Arg				720
	_		_	_	_			_	_		gly ggg				768
tgc Cys	tga *														774

<210> 8 <211> 257

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<212> PRT
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<400> 8
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
                                                      15
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
                               25
40
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser
                       55
Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys
                   70
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Asn Ala Tyr Pro
Gly Phe Ala His Gly Gly Thr Glu Val Glu Gly Lys Arg Glu Ile Ala
                               105
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
                           120
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Ala Ser Asn Arg Gln
                       135
                                           140
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
                   150
                                       155
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ser Leu Gly Phe
                                   170
               165
Asp Gly Leu Gly Asp Pro Asp Ala Val Ala Arg Ser Ala Val Leu Ala
                               185
           180
                                                   190
Phe Arg Ser Ala Leu Trp Tyr Trp Met Asn Asn Val His Gly Val Val
                           200
                                               205
Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala Leu Glu
                       215
                                           220
Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
                   230
                                       235
Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
               245
                                   250
Cys
<210> 9
<211> 756
<212> DNA
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1) ... (756)
<400> 9
teg acg cag aac tge gge tge geg teg gge etg tge tge age egg tte
                                                                 48
Ser Thr Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
1
ggc tac tgc ggc acg acc gac gcc tac tgc ggc gac ggg tgc cag tcg
                                                                 96
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
```

									agc Ser							144
									ttc Phe							192
									aat Asn							240
	_	-	-	-	_				ggc Gly 90		_				_	288
				_	_			_	gcc Ala					_	_	336
						_			aac Asn			_		_	_	384
									cag Gln							432
					-		_	_	cag Gln		_					480
									ttc Phe 170							528
									gcg Ala							576
									atg Met							624
									gag Glu							672
_	_	_		_	_	_			tac Tyr		_		_	_	_	720
		_	_	_					acc Thr 250	_	tga *					756

<210> 10

<211> 251

<212> PRT

<213> Artificial Sequence

<400> 10

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Ser Thr Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
                                 10
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
                             25
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
                          40
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser
                      55
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
                  70
                                     75
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                 90
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asp Gly Pro Ser
       115
                          120
Lys Asn Tyr Cys Asp Arg Asn Asn Thr Gln Trp Pro Cys Gln Ala Gly
                      135
                                         140
Lys Gly Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn
                  150
                                     155
Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro
               165
                                 170
Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp
           180
                              185
Phe Trp Met Lys Asn Met His Gln Leu Met Pro Gln Gly Phe Gly Ala
       195
                          200
                                             205
Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro
                      215
                                         220
Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln
                  230
                                     235
Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys
               245
<210> 11
<211> 774
<212> DNA
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1) ... (774)
<400> 11
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt
                                                              48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
1
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg
                                                              96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
            20
144
```

		35					40					45				
						gcg Ala 55										192
						aac Asn										240
						gcg Ala										288
						tcc Ser										336
						acg Thr										384
						aac Asn 135										432
	_	_	_			cag Gln	_				_		_	_	_	480
						tac Tyr										528
_				_		ggc Gly					-	_				576
	_					ttc Phe		_					_		_	624
						acc Thr 215										672
_						gcc Ala	_	_			_	_				720
agg Arg	cag Gln	tac Tyr	tgc Cys	cgc Arg 245	cag Gln	ctc Leu	ggc Gly	gtc Val	gac Asp 250	ccg Pro	ggc	aac Asn	aac Asn	ctc Leu 255	acc Thr	768
tgc Cys	tga *															774

<210> 12 <211> 257

<212> PRT

<213> Artificial Sequence

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<220>
<223> Variant sequence produced by shuffling techniques
<400> 12
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Glu Ala Ile Ala Ala Tyr Pro
                                   90
Gly Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala
                               105
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
                           120
Ser Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
                       135
                                           140
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
                   150
                                       155
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
               165
                                   170
Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala
           180
                               185
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met
                           200
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu
                       215
Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
                   230
                                       235
Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu Thr
               245
                                   250
Cys
<210> 13
<211> 756
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1)...(756)
<400> 13
teg atg cag aac tge gge tge geg teg gge etg tge tge age egg tte
                                                                48
Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
gge tae tge gge aeg aee gae gee tae tge gge gae ggg tge eag teg
                                                                96
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
            20
ggc ccg tgc cgc tcg ggc ggc ggc agc agt ggc ggc ggt ggt gcg
                                                                144
```

Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala

35 40 45

									ggc Gly			192
									acc Thr			240
									cat His			288
									gcg Ala			336
				_					gac Asp 125	 _	_	384
									tgc Cys			432
_			_		_	_	_	_	tgg Trp			480
									ctc Leu			528
									gcg Ala			576
									999 Gly 205		-	624
									Gly aaa			672
									tac Tyr			720
							acc Thr 250	tga *				756

<210> 14

<211> 251

<212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

```
Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
                          40
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
                  70
                                     75
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                 90
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
                              105
His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asp Gly Pro Ser
Lys Asn Tyr Cys Asp Arg Asn Asn Thr Gln Trp Pro Cys Gln Ala Gly
                      135
Lys Gly Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn
                                     155
                  150
Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro
               165
                                  170
Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp
                              185
Phe Trp Met Lys Asn Ile His Gln Leu Met Pro Gln Gly Phe Gly Ala
                          200
Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro
                      215
                                         220
Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln
                  230
                                     235
Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys
               245
<210> 15
<211> 777
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1)...(777)
<400> 15
teg atg cag aac tge gge tge cag eea aac gta tge tge age aag tte
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tca
                                                              96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
144
35
ggc gga ggc agt ggc ggg gcg aac gtg gct agc gtc gtc acc ggc tcc
                                                              192
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser
```

<400> 14

							ggg Gly					240
							agc Ser 90					288
							gag Glu					336
_				_	_		 acc Thr			_		384
							tac Tyr					432
		_	 _			_	 tac Tyr					480
_		_					 ccc Pro 170		 	_		 528
							gtg Val					576
		_	 				 atg Met	_	_		_	624
							agg Arg					672
							atg Met					720
							gtc Val 250					768
	tgc Cys											777

```
<210> 16
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<400> 16

Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe

<211> 258

<212> PRT

<213> Artificial Sequence

⁻²²⁰⁻

<223> Variant sequence produced by shuffling techniques

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Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
40
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser
                      55
Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys
                  70
                                      75
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro
                                  90
Gly Phe Ala His Gly Gly Ser Glu Val Glu Gly Lys Arg Glu Ile Ala
                              105
Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile
                          120
Asn Glu Ile Asp Gly Pro Ser Lys Asn Tyr Cys Asp Arg Asn Asn Thr
                      135
                                         140
Gln Trp Pro Cys Gln Ala Gly Lys Gly Tyr Tyr Gly Arg Gly Pro Leu
                                      155
Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly
               165
                                  170
Phe Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val
                              185
Ala Phe Lys Ala Ala Leu Trp Phe Trp Met Lys Asn Met His Gln Leu
                          200
Met Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu
                      215
                                         220
Glu Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr
                  230
                                      235
Tyr Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu
               245
                                  250
Thr Cys
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<210> 17 <211> 280 <212> PRT

<213> Zea mays

<400> 17

Met Ala Asn Ala Pro Arg Ile Leu Ala Leu Gly Leu Leu Ala Leu Leu Cys Ala Ala Ala Gly Pro Ala Ala Ala Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser Gly Pro Cys Arg Ser Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn Gly Ile Lys Asn Gln Ala 85 90 Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe Leu 105 110 Ser Ala Val Asn Ala Tyr Pro Gly Phe Ala His Gly Gly Thr Glu Val 120 125 Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr His Glu 135 140 Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala Tyr 150 155 Cys Asp Ala Ser Asn Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys Tyr 170

<210> 18 <211> 269 <212> PRT <213> Zea mays <400> 18

Pro Gln Leu Val Ala Leu Gly Leu Ala Leu Cys Ala Val Ala Gly Pro Ala Ala Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys 40 Gln Ser Gly Pro Cys Arg Ser Gly Arg Gly Gly Gly Ser Gly Gly 55 Gly Gly Ala Asn Val Ala Ser Val Val Thr Ser Ser Phe Phe Asn Gly 70 Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr 85 Arg Ser Ala Phe Leu Ser Ala Val Lys Gly Tyr Pro Gly Phe Ala His 100 105 Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala 120 125 His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn 135 140 Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala 150 155 Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn 165 170 Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly 180 185 Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala 200 Leu Trp Phe Trp Met Asn Ser Val His Gly Val Val Pro Gln Gly Phe 215 Gly Ala Thr Thr Arg Ala Met Gln Arg Ala Leu Glu Cys Gly Gly Asn 235 Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys 245 250 Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys

<210> 19 <211> 280

<212> PRT

<213> Zea mays

<400> 19 Met Ala Asn Ala Pro Arg Ile Leu Ala Leu Gly Leu Leu Ala Leu Leu Cys Ala Ala Ala Gly Pro Ala Ala Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe Gly Tyr Cys Gly Thr Thr Asp Ala Tyr 40 Cys Gly Asp Gly Cys Gln Ser Gly Pro Cys Arg Ser Gly Ser Gly Gly Ala Asn Val 70 75 Ala Asn Val Val Thr Asp Ala Phe Phe Asn Gly Ile Lys Asn Gln Ala 85 90 Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe Leu 100 105 Ser Ala Val Asn Ala Tyr Pro Gly Phe Ala His Gly Gly Thr Glu Val 120 125 Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr His Glu 135 Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala Tyr 150 Cys Asp Ala Ser Asn Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys Tyr 170 Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro 185 Ala Gly Arg Asp Ile Gly Phe Asn Gly Leu Ala Asp Pro Asn Arg Val 200 Ala Gln Asp Ala Val Ile Ala Phe Lys Thr Ala Leu Trp Phe Trp Met 215 220 Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr Ile Arg 230 235 Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala Gln Met 245 250 Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Gln Gln Leu Arg Val 260 265 Asp Pro Gly Pro Asn Leu Ile Cys 275

<210> 20 <211> 270 <212> PRT <213> Zea mays

<400> 20

Pro Gln Leu Val Ala Leu Gly Leu Ala Leu Leu Cys Ala Val Ala Gly 10 Pro Ala Ala Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser 25 Lys Phe Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser Gly Pro Cys Arg Ser Gly Arg Gly Gly Gly Ser Gly Gly Gly Gly Ala Asn Val Ala Ser Val Val Thr Ser Ser Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr 90 Arg Ser Ala Phe Leu Ser Ala Val Asn Lys Gly Tyr Pro Gly Phe Ala 105 110 His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe 120 125 Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile 135 140

Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys 150 155 Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp 170 Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu 185 Phe Asp Pro Phe Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala 200 Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val Val Pro Gln Gly 215 220 Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly 230 235 Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr 250 Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys 265

<210> 21 <211> 753 <212> DNA <213> Artificial Sequence <223> Variant sequence produced by shuffling techniques <221> CDS <222> (1) ... (753) <400> 21 teg atg cag aac tge ggg tge geg teg gge etg tge tge age egg tte 48 Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe ggg tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg 96 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser 20 ggc ccg tgc cgc tcg ggc ggc ggc agc agt ggc ggc ggt ggt gcg 144 Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala 40 aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag agc 192 Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser 55 cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg 240 Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala 70 tte etg age gee gte aag geg tae eea gge tte gee eat gge ggg teg 288 Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser cag gtg cag ggc aag cgc gag atc gcc gcc ttc ttc gcg cac gcc acg 336 Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr

cac gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac

His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn 115 120 125

gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag

384

432

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Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
    130
                        135
aag tac tac ggg cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac
                                                                   480
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
                    150
                                        155
ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc ggg gac ccc ggc
                                                                   528
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
                                     170
agg gtg gcg cgg gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg ttc
                                                                   576
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
            180
                                185
tgg atg aac aac gtg cac cgt gtg atg ccg cag ggc ttc ggc gcc acc
                                                                   624
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
        195
                            200
ate agg gee ate aac gge geg ete gag tge aac ggg aac aac eec gee
                                                                   672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala
                        215
                                             220
cag atg aac gcg cgc gtc ggc tac tac aag cag tac tgc cag cag ctc
                                                                   720
Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Gln Gln Leu
                    230
cgc gtc gac cca ggg ccc aac ctc acc tgc tga
                                                                   753
Arg Val Asp Pro Gly Pro Asn Leu Thr Cys
                245
<210> 22
<211> 250
<212> PRT
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<400> 22
Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
                            40
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser
                        55
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                     90
Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr
                                105
                                                     110
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
        115
                            120
                                                 125
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
                        135
                                             140
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
                    150
                                        155
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
                                     170
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185 Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr 200 Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala 215 220 Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Gln Gln Leu 230 235 Arg Val Asp Pro Gly Pro Asn Leu Thr Cys 245 <210> 23 <211> 774 <212> DNA <213> Artificial Sequence <223> Variant sequence produced by shuffling techniques <221> CDS <222> (1) ... (774) <400> 23 tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt 48 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg 96 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser gge eeg tge ege teg gge gge gge age agt gge gge gge gga gge 144 Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Gly ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg 192 Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala 55 60 ttc ttc aac ggc atc aag aac cag gcc ggg agc tgg tgc gag ggc aag 240 Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Trp Cys Glu Gly Lys aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca 288 Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro 90 ggc ttc gcc cat ggc ggg tcg cag gtg cag ggc aag cgc gag atc gcc 336 Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala gcc ttc ttc gcg cat gtc acg cac gag acc ggg cat ttg tgc tac atc 384 Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Leu Cys Tyr Ile aac gag gtc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag 432 Asn Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag 480 Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln 150 155

Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe

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atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc
                                                                   528
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
                                    170
gac ggg ctg gga gac ccg gac aga ctg gcg cag gac ccc gtg ttg tcg
                                                                   576
Asp Gly Leu Gly Asp Pro Asp Arg Leu Ala Gln Asp Pro Val Leu Ser
            180
                                185
                                                     190
tte aag teg geg ete tgg tte tgg atg aac aac gtg cac egt gtg atg
                                                                   624
Phe Lys Ser Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met
        195
                            200
ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag
                                                                   672
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu
                        215
tgc ggc ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac
                                                                   720
Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
agg cag tac tgc cgc cag ctc ggc gtc gac ccg ggc aac aac ctc acc
                                                                   768
Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu Thr
                                    250
tgc tga
                                                                   774
Cys *
<210> 24
<211> 257
<212> PRT
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
                                25
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Gly
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
                        55
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Trp Cys Glu Gly Lys
                    70
                                         75
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro
                85
                                     90
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala
            100
                                105
Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Leu Cys Tyr Ile
                            120
Asn Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
                        135
                                             140
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
                    150
                                         155
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
                165
                                    170
Asp Gly Leu Gly Asp Pro Asp Arg Leu Ala Gln Asp Pro Val Leu Ser
            180
                                185
                                                     190
```

Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu 215 Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr 230 235 Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu Thr 245 250 Cys <210> 25 <211> 765 <212> DNA <213> Artificial Sequence <223> Variant sequence produced by shuffling techniques <221> CDS <222> (1) ... (765) <400> 25 teg atg cag aac tge ggg tge geg teg gge etg tge tge age egg tte 48 Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe ggg tac tgc ggg acg ggc gag gac tac tgc ggc gcc ggg tgc cag tcg 96 Gly Tyr Cys Gly Thr Gly Glu Asp Tyr Cys Gly Ala Gly Cys Gln Ser 144 40 agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg ttc ttc aac 192 Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac 240 Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr 70 ace egg age geg tte etg age gee gte aag geg tae eea gge tte geg 288 Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala 90 cat ggc ggc tcc gag gtc gag cgc aag cgc gag att gcc gcc ttc ttc 336 His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe gcg cat gtc acg cac gag acc ggg cat ttc tgc tac atc agc gag atc 384 Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc 432 Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys gee geg ggg cag aag tac tac ggc cgc ggc ccg ctg cag atc tcc tgg 480 Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp 145 155

Phe Lys Ser Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met 195 200 205

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aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctg
                                                                 528
Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu
               165
gga gac ccg gac aga ctg gcg cag gac ccc gtg ttg tcg ttc aag gcg
                                                                 576
Gly Asp Pro Asp Arg Leu Ala Gln Asp Pro Val Leu Ser Phe Lys Ala
           180
                               185
                                                   190
geg etc tgg ttc tgg atg aac aac gtg cac egt gtg atg eeg eag gge
                                                                 624
Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly
        195
                           200
                                               205
tte gge gee ace ate agg gee ate aac gge gee ete gag tge aac ggg
                                                                 672
Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly
    210
                       215
aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac agg cag tac
                                                                 720
Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr
                   230
tgc cgc cag ctc ggc gtc gac ccg ggc aac aac ctc acc tgc tga
                                                                 765
Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys
<210> 26
<211> 254
<212> PRT
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<400> 26
Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
Gly Tyr Cys Gly Thr Gly Glu Asp Tyr Cys Gly Ala Gly Cys Gln Ser
                               25
35
                           40
Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn
                       55
Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr
                   70
                                       75
Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala
                85
                                   90
His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe
                               105
Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile
                           120
Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys
                       135
Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp
                                       155
Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu
                                   170
Gly Asp Pro Asp Arg Leu Ala Gln Asp Pro Val Leu Ser Phe Lys Ala
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180 185 190 Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly

Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly

210 Asn Asn Pro 225	Ala Gln Met	215 Asn Ala Arg		220 Tyr Tyr Arg	-
		Asp Pro Gly		Leu Thr Cys	240
<210> 27 <211> 753 <212> DNA <213> Artif:	icial Sequen	ce			
<220> <223> Varia	nt sequence	produced by a	shuffling	techniques	
<221> CDS <222> (1)	. (753)				
		tgc cag cca Cys Gln Pro			_
		gac gcc tac Asp Ala Tyr 25			
		ggc ggc ggc Gly Gly Gly 40			
		acc ggc tcc Thr Gly Ser 55			
		gag ggc aag Glu Gly Lys			
		gcg tac cca Ala Tyr Pro	Gly Phe		
		gag att gcc Glu Ile Ala 105	_		
		tgc tac atc Cys Tyr Ile 120			
		aag agg cag Lys Arg Gln 135	Trp Pro		
		ccg ctg cag Pro Leu Gln	_		
		atc ggc ttc Ile Gly Phe			

```
agg gtg gcg cgg gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg ttc
                                                                   576
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
            180
tgg atg aac aac gtg cac cgt gtg atg ccg cag ggc ttc ggc gcc acc
                                                                   624
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
        195
ate agg gee ate aac gge gee ete gag tge gae gge aag aac eee aac
                                                                   672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asp Gly Lys Asn Pro Asn
    210
                        215
tcc gtc aac aac cgc gtc gcc tac tac aag cag ttc tgc cag gat ttc
                                                                   720
Ser Val Asn Asn Arg Val Ala Tyr Tyr Lys Gln Phe Cys Gln Asp Phe
                    230
                                        235
                                                                   753
ggc gtc gac cca ggg ccc aac ctt act tgc tga
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys *
                245
<210> 28
<211> 250
<212> PRT
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
                                    10
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
                                25
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
                            40
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser
                        55
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
                    70
                                        75
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                    90
                85
Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
                                105
                                                     110
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
                            120
                                                 125
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
                        135
                                             140
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
                    150
                                        155
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
                165
                                    170
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
                                185
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
                            200
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asp Gly Lys Asn Pro Asn
                        215
                                             220
Ser Val Asn Asn Arg Val Ala Tyr Tyr Lys Gln Phe Cys Gln Asp Phe
                    230
                                         235
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
                245
```

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<210> 29
<211> 774
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1) ... (774)
<400> 29
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                                                               48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
                                   10
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg
                                                               96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
            20
144
35
ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg
                                                               192
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag
                                                               240
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
aac ttc tac acc egg age geg ttc etc gag gee atc gee geg tac eeg
                                                               288
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Glu Ala Ile Ala Ala Tyr Pro
                                   90
ggc ttc gcg cat ggc ggc tcc gag gtc gag cgc aag cgc gag att gcc
                                                               336
Gly Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala
           100
                                                 110
gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc
                                                               384
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
       115
                          120
age gag gte aac aag age aac gee tac tge gae eeg ace aag agg cag
                                                               432
Ser Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
   130
                      135
tgg ceg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg caq
                                                               480
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
145
                   150
atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc
                                                               528
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
gac ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg
                                                               576
Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala
           180
ttc aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg
                                                               624
```

Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met

195 200 205

```
ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag
                                                                672
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu
   210
                       215
tgc ggc ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac
                                                                720
Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
aag cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act
                                                                768
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
               245
tgc tga
                                                                774
Cys *
<210> 30
<211> 257
<212> PRT
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
                               25
40
Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
                       55
                                           60
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
                                       75
                   70
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Glu Ala Ile Ala Ala Tyr Pro
               85
                                   90
Gly Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala
                               105
                                                   110
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
                           120
Ser Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
                       135
                                           140
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
                   150
                                       155
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
                                   170
               165
Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala
                               185
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu
                       215
Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
                                       235
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
               245
Cys
```

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<210> 31
<211> 753
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1) ... (753)
<400> 31
tcg atg cag aac tgc ggc tgc cag cca aac ttc tgc tgc agc aag ttt
                                                                   48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
                                     10
ggc tac tgc ggc acg acc gac gag tac tgc ggc gcc ggg tgc cag tcg
                                                                   96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser
gge eeg tge ege teg gge gge gge age agt gge gge ggt ggt geg
                                                                   144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag aac
                                                                   192
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg
                                                                   240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
65
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggc tcc
                                                                   288
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                     90
                                                          95
gag gtc gag cgc aag cgc gag atc gcc gcc ttc ttc gcg cac gcc acg
                                                                   336
Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr
            100
                                105
cat gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac
                                                                   384
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
        115
ged tad tgd gad deg add aag agg dag tgg deg tgd ged geg gag dag
                                                                   432
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
    130
aag tac tac ggg cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
145
                    150
ggg ccc gcg ggg agg gcc atc ggc ttt gac ggg ctc ggg gac ccc ggc
                                                                   528
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
agg gtg gcg cag gac ccc gtg ctg gcg ttc aag gcg gcg ctc tgg ttc
                                                                   576
Arg Val Ala Gln Asp Pro Val Leu Ala Phe Lys Ala Ala Leu Trp Phe
            180
tgg atg aac agc gtg cac ggg gtg gtg ccg cag ggc ttc ggc gcc acc
                                                                   624
Trp Met Asn Ser Val His Gly Val Val Pro Gln Gly Phe Gly Ala Thr
```

```
195
                            200
                                                205
atc agg gcc atc aac ggc gcc ctc gag tgc aac ggg aac aac ccc gcc
                                                                   672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala
    210
                        215
cag atg aac gcg cgc gtc ggc tac tac aag cag ttc tgc cag gat ttc
                                                                   720
Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Phe Cys Gln Asp Phe
ggc gtc gac cca ggg ccc aac ctc act tgc tga
                                                                   753
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
                245
<210> 32
<211> 250
<212> PRT
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
                            40
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
                                        75
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                    90
Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr
                                105
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
```

145 150 155 160

Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly

165 170 175

Arg Val Ala Gln Asp Pro Val Leu Ala Phe Lys Ala Ala Leu Trp Phe

Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr

115 120 125 Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln

135

180 185 190
Trp Met Asn Ser Val His Gly Val Val Pro Gln Gly Phe Gly Ala Thr
195 200 205

Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala 210 215 220

Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Phe Cys Gln Asp Phe 225 230 235 240

Gly Val Asp Pro Gly Pro Asn Leu Thr Cys 245 250

<210> 33

<211> 774

<212> DNA

<213> Artificial Sequence

140

<220> <223> Variant sequence produced by shuffling techniques <221> CDS <222> (1) ... (774) <400> 33 tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aaq ttt 48 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe gge tae tge gge aca ace gae gag tae tge gge gae ggg tge cag teg 96 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser 144 40 ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg 192 Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala 55 ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag 240 Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys 70 aac ttc tac acc cgg agc gcg ttc ctc gag gcc atc gcc gcg tac ccg 288 Asn Phe Tyr Thr Arg Ser Ala Phe Leu Glu Ala Ile Ala Ala Tyr Pro gge tte geg cat gge gge tee gag gte gag ege aag ege gag att gee 336 Gly Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc 384 Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile 115 age gag gte aac aag age aac gee tae tge gae eeg aee aag agg eag 432 Ser Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln 130 tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag 480 Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln 145 atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe 165 170 175 gac ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg 576 Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala 180 ttc aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg 624 Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arq Val Met 195 ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag 672 Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu 210

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tgc ggc ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac
                                                                720
Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
225
aag cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act
                                                                768
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
tgc tga
                                                                774
Cys *
<210> 34
<211> 257
<212> PRT
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
40
Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
                       55
                                          60
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
                   70
                                      75
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Glu Ala Ile Ala Ala Tyr Pro
               85
                                   90
Gly Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala
                               105
                                                  110
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
                           120
                                              125
Ser Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
                       135
                                          140
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
                   150
                                      155
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
               165
                                  170
Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala
                               185
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met
       195
                           200
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu
                       215
Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
                   230
                                      235
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
Cys
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<210> 35 <211> 753 <212> DNA

<213> Artificial Sequence

<220> <223> Variant sequence produced by shuffling techniques											
<221> CDS <222> (1)(753)											
<pre><400> 35 tcg atg cag aac tgc Ser Met Gln Asn Cys 1 5</pre>			_								
ggc tac tgc ggc acg Gly Tyr Cys Gly Thr 20											
ggc ccg tgc cgc tcg Gly Pro Cys Arg Ser 35											
aac gtg gct agc gtc Asn Val Ala Ser Val 50											
cag gcc ggg agc ggg Gln Ala Gly Ser Gly 65											
ttc ctg agc gcc gtc Phe Leu Ser Ala Val 85											
gag gtg gag ggc aag Glu Val Glu Gly Lys 100		Ala Phe Phe Ala B									
cac gag acc ggg cat His Glu Thr Gly His 115											
gcc tac tgc gac ccg Ala Tyr Cys Asp Pro 130											
aag tac tac ggg cgc Lys Tyr Tyr Gly Arg 145											
ggg ccc gcg ggg agg Gly Pro Ala Gly Arg 165											
agg gtg gcg cgg gac Arg Val Ala Arg Asp 180		Phe Lys Ala Ala									
tgg atg aac aac gtg Trp Met Asn Asn Val											
195	200	205									
atc agg gcc atc aac Ile Arg Ala Ile Asn											

210 215 220

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cag atg aac gcg cgc gtc ggc tac tac aag cag tac tgc cag cag ctc
                                                                  720
Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Gln Gln Leu
cgc gtc gac cca ggg ccc aac ctc act tgc tga
                                                                  753
Arg Val Asp Pro Gly Pro Asn Leu Thr Cys *
                245
<210> 36
<211> 250
<212> PRT
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
                                    10
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Val
                            40
Asn Val Ala Ser Val Val Thr Asp Ser Phe Phe Asn Gly Ile Lys Ser
                        55
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
                                        75
Phe Leu Ser Ala Val Asn Ala Tyr Pro Gly Phe Ala His Gly Gly Thr
                                    90
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr
                                105
His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asn Lys Ser Asn
                            120
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
                        135
                                            140
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
                    150
                                        155
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
                165
                                    170
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
                                185
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
                            200
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala
                        215
                                            220
Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Gln Gln Leu
                    230
                                        235
Arg Val Asp Pro Gly Pro Asn Leu Thr Cys
                245
<210> 37
<211> 774
<212> DNA
<213> Artificial Sequence
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<223> Variant sequence produced by shuffling techniques

<220>

<221> CDS <222> (1)...(774)

<400> 37 tcq atq caq aac tqc qqc tqc caq cca aac qta tqc tqc aqc aaq ttt Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe 10 gge tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg 96 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser 144 40 ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg 192 Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Thr Asp Ala 55 tto tto aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag 240 Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys 70 aac ttc tac acc cgg aga gcg ttc ctg agc gcc gtc aag gcg tac cca 288 Asn Phe Tyr Thr Arg Arg Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro ggc ttc gcc cat ggc ggg tcg cag gtg cag ggc aag cgc gag atc gcc 336 Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc 384 Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile 115 120 age gag ate aac aag age aac gee tae tge gae eeg ace aag agg eag 432 Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln 130 tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag 480 Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln 145 atc tcg tgg aac tac aac tac ggg ccc gcc ggg agg gac atc ggc ttc 528 Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Asp Ile Gly Phe 165 170 175 aac ggg ctc gcc gac ccc aac agg gtg gcg cag gac gcc gtg gtg gcg 576 Asn Gly Leu Ala Asp Pro Asn Arg Val Ala Gln Asp Ala Val Val Ala 180 ttc aag gcg gcg ctc tgg ttc tgg atg aac agc gtg cac ggg gtg gtg Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val Val 195 ccg cag ggg ttc ggc gcc acc acc agg gcc atc aac ggc gcc ctc gag Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala Leu Glu 210

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tgc aac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac
                                                               720
Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
agg cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act
                                                                768
Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
               245
tgc tga
                                                                774
Cys *
<210> 38
<211> 257
<212> PRT
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
                                   10
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
                               25
40
Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Thr Asp Ala
                       55
                                          60
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
                   70
                                      75
Asn Phe Tyr Thr Arg Arg Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro
               85
                                  90
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala
                              105
                                                  110
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
                           120
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
                       135
                                          140
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
                   150
                                      155
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Asp Ile Gly Phe
               165
                                   170
Asn Gly Leu Ala Asp Pro Asn Arg Val Ala Gln Asp Ala Val Val Ala
                               185
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val Val
                           200
Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala Leu Glu
                       215
Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
                                      235
Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
               245
Cys
```

<210> 39

<211> 780

<212> DNA

<213> Artificial Sequence

<220> <223> Variant sequence produced by shuffling techniques
<221> CDS <222> (1)(780)
<pre><400> 39 tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc 48 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe</pre>
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg 96 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser 20 25 30
ggc ccg tgc cac tcg ggc ggc ggc ggc agc tgt ggc ggc ggt ggc ggc 144 Gly Pro Cys His Ser Gly Gly Gly Gly Ser Cys Gly Gly Gly Gly Gly 35 40 45
ggc agc ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc Gly Ser Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr 50 55 60
ggc tcc ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag Gly Ser Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu 65 70 75 80
ggc aag aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg 288 Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala 85 90 95
tac cca ggc ttc gcc cat ggc ggg tca cag gtg cag ggc aag cgc gag 336 Tyr Pro Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu 100 105 110
atc gcc gcc ttc ttc gcg cat gtc acg cac gag acc ggg cat ttc tgc 384 Ile Ala Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys 115 120 125
tac atc agc gag atc aac aag agc aac gcc tac tgc gac ccg acc aag Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys 130 135 140
agg cag tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg 480 Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro 145 150 155 160
ctg cag atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile 165 170 175
ggc ttc gac ggg ctc ggg gac ccc ggc agg gtg gcg cag gac gcc gtg 576 Gly Phe Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Gln Asp Ala Val 180 185 190
atc gcg ttc aag tcg gcg ctc tgg tac tgg atg gag aac atg cac cag 1le Ala Phe Lys Ser Ala Leu Trp Tyr Trp Met Glu Asn Met His Gln 195 200 205
ctc atg ccc cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc 672 Leu Met Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala 210 215 220

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ctc gag tgc ggc ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc
                                                                   720
Leu Glu Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly
                    230
tac tac aag cag tac tgc cac cag ctc ggc gtc gac cca ggg ccc aac
                                                                   768
Tyr Tyr Lys Gln Tyr Cys His Gln Leu Gly Val Asp Pro Gly Pro Asn
                245
                                    250
ctc act tgc tga
                                                                   780
Leu Thr Cys *
<210> 40
<211> 259
<212> PRT
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<400> 40
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
                                    10
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
                                25
                                                     3.0
Gly Pro Cys His Ser Gly Gly Gly Gly Ser Cys Gly Gly Gly Gly Gly
                            40
Gly Ser Gly Gly Ger Gly Gly Ala Asn Val Ala Asn Val Val Thr
                        55
Gly Ser Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu
                    70
                                        75
Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala
                85
                                    90
Tyr Pro Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu
                                105
Ile Ala Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys
                            120
                                                 125
Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys
                        135
Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro
                                        155
Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile
                                    170
Gly Phe Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Gln Asp Ala Val
                                185
Ile Ala Phe Lys Ser Ala Leu Trp Tyr Trp Met Glu Asn Met His Gln
                            200
Leu Met Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala
                        215
                                             220
Leu Glu Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly
                    230
                                        235
Tyr Tyr Lys Gln Tyr Cys His Gln Leu Gly Val Asp Pro Gly Pro Asn
                245
                                    250
Leu Thr Cys
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<210> 41

<211> 771

<212> DNA

<213> Artificial Sequence

<223> Variant sequence produced by shuffling techniques <221> CDS <222> (1) ... (771) <400> 41 teg atg cag aac tge ggg tge geg teg ggc atg tge tge age egg tte 48 Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Met Cys Cys Ser Arg Phe 10 gge tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg 96 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser gga ggc agt ggc ggt gcg aac gtg gct agc gtc acc ggc tcc ttc 192 Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe ttc agc ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag aac 240 Phe Ser Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn 65 70 288 ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly 85 tte gee cat gge ggg aeg gag gtg gag gge aag ege gag ate gee gee 336 Phe Ala His Gly Gly Thr Glu Val Glu Gly Lys Arg Glu Ile Ala Ala tte ete geg cae ate aeg cae gag ace ggg cat tte tge tae ate age 384 Phe Leu Ala His Ile Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser 115 gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg 432 Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp 130 ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag atc Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile 145 teg tgg aac tac aac tac ggg eec geg ggg agg gee ate gge ete gae 528 Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Leu Asp 165 175 ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg ttc 576 Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe 180 190 aag gcg gcg ctc tgg ttc tgg atg aac agc gtg cac ggg gtg atg ccc 624 Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val Met Pro 195 205 200 cag ggg ttc ggc gcc acc atc agg gcc atc aac ggc gcg ctc gag tgc 672

<220>

Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys

210 215 220

gac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac aag 720 Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys 230 cag tac tgc cag cag ctc cgc gtc gac ccg ggc aac aac ctc act tgc 768 Gln Tyr Cys Gln Gln Leu Arg Val Asp Pro Gly Asn Asn Leu Thr Cys 771 tga <210> 42 <211> 256 <212> PRT <213> Artificial Sequence <223> Variant sequence produced by shuffling techniques <400> 42 Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Met Cys Cys Ser Arg Phe Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser 25 40 Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe 55 Phe Ser Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn 70 75 Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Thr Glu Val Glu Gly Lys Arg Glu Ile Ala Ala 105 Phe Leu Ala His Ile Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser 120 125 Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp 135 Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile 150 155 Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Leu Asp 170 Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe 185 Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val Met Pro 200 Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys 220

Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys

Gln Tyr Cys Gln Gln Leu Arg Val Asp Pro Gly Asn Asn Leu Thr Cys

<210> 43

<211> 753

<212> DNA

<213> Artificial Sequence

250

<220> <223> Variant sequence produced by shuffling techniques																
	<221> CDS <222> (1)(753) <400> 43															
tcg	atg	cag		_		_	_			_	_	tgc Cys	_	_		48
												Gl ^A aaa				96
												ggc Gly 45				144
												ggc Gly				192
_	_		_		_			_				acc Thr		_		240
											_	cat His				288
												gcg Ala				336
						_			_			aac Asn 125	_	_		384
												gcc Ala				432
												aac Asn				480
												gly aaa				528
				_	_					_		gcg Ala				576
												ttc Phe 205				624
												aac Asn				672

210 215 220

720

753

cag atg aac gcg cgc gtc ggc tac tac aag cag tac tgc cgc cag ctc Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu 230 ggc gtc gac cca ggg ccc aac ctc act tgc tga Gly Val Asp Pro Gly Pro Asn Leu Thr Cys 245 <210> 44 <211> 250 <212> PRT <213> Artificial Sequence <220> <223> Variant sequence produced by shuffling techniques Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser 25 Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala 40 Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn Gly Ile Lys Asn 55 Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala 70 75 Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser 90 85 95 Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr 105 His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn 120 125 Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln 135 140 Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr 150 155 Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly 165 170 Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe 180 185 Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr 200 Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala 215 220 Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu 230 Gly Val Asp Pro Gly Pro Asn Leu Thr Cys 245 <210> 45 <211> 774 <212> DNA <213> Artificial Sequence

42

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1) ... (774)

<400> 45															
_	_	_		_		_	_			_	_	_	_	cgg Arg 15	48
														cgg Arg	96
	_	_	_	_										gga Gly	 144
			_						-			_		gac Asp	 192
														ggc Gly	240
					_			_	_	_	_	_		tac Tyr 95	288
														atc Ile	336
-					_	_							_	tac Tyr	384
														agg Arg	432
														ctg Leu	480
														ggc Gly 175	528
														gtg Val	576
														gtg Val	624
														ctc Leu	672
														tac Tyr	720

```
aag cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
tgc tga
Cys *
<210> 46
<211> 257
<212> PRT
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Arg Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Arg Ser
40
Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
                       55
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
                                       75
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro
                                   90
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala
                               105
                                                  110
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
        115
                           120
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
                       135
                                           140
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
                   150
                                       155
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
               165
                                   170
Asp Gly Leu Gly Asp Pro Asn Arg Val Ala Arg Asp Ala Val Val Ala
           180
                               185
                                                   190
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val Val
                           200
Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala Leu Glu
                       215
Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
                   230
                                       235
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
                                   250
Cys
<210> 47
<211> 771
<212> DNA
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
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774

<221> CDS

<222> (1)...(771)

<400>	. 47														
tcg a Ser M	tg	cag		_	-	_	_			_	_	_	_	_	48
ggc t Gly T															96
ggc c Gly P															144
gga g Gly G	_	_						_	_	_	_				192
ttc a Phe A 65															240
ttc t Phe T															288
ttc g Phe A															336
ttc t Phe P															384
gag g Glu V 1	-		_	_		_		_	_	_		_		_	 432
ccg t Pro C 145															480
tcg t Ser T															528
ggg c															576
aag g Lys A															624
cag g Gln G 2															672
ggc g Gly G 225															720

```
cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act tgc
                                                                768
Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
                                                                771
tga
<210> 48
<211> 256
<212> PRT
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
                               25
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe
                       55
Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn
                   70
Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly
                                   90
Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala
            100
                               105
Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Arg Tyr Ile Ser
                           120
Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp
                       135
Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile
                                       155
Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp
                                   170
Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe
                               185
Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro
                           200
        195
Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys
                       215
                                           220
Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg
                                       235
                   230
Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
               245
<210> 49
<211> 753
<212> DNA
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1) ... (753)
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<400															
								aac Asn 10							48
		_		_	_			tgc Cys		_		_	_	_	96
								agc Ser							144
								ttc Phe							192
								aac Asn							240
								ggc Gly 90							288
								gcc Ala							336
	_				_			agc Ser			_	_	_		384
_		_	_	_	_		_	tgg Trp	_	_	_			_	432
								atc Ile							480
								gac Asp 170							528
								ttc Phe							576
								ccg Pro							624
								tgc Cys							672
								aag Lys							720
						ctc Leu		tgc Cys	tga *						753

```
<210> 50
<211> 250
<212> PRT
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<400> 50
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
                                25
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Val
                            40
Asn Val Ala Ser Ile Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn
                        55
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
                    70
                                        75
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Thr
                                    90
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
                                105
                                                    110
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Ser Lys Ser Asn
                            120
                                                 125
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
                        135
                                             140
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
                    150
                                        155
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
                165
                                    170
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
            180
                                185
Trp Met Asn Ser Val His Gly Val Ala Pro Gln Gly Phe Gly Ala Thr
                            200
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala
                        215
Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys His Gln Leu
                    230
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
                245
<210> 51
<211> 753
<212> DNA
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1) ... (753)
<400> 51
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt
                                                                   48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg
                                                                   96
```

Gly	Tyr	Cys	Gly 20	Thr	Thr	Asp	Glu	Tyr 25	Cys	Gly	Asp	Gly	Cys 30	Gln	Ser	
														ggt Gly		144
														aag Lys		192
_	_		_		_			_						agc Ser		240
	_	_	_	_	_						_			999 Gly 95	_	288
_		_		_	_			_	_					gtc Val	_	336
														agc Ser		384
														ggg ggg		432
_				_		_	_	_		_				aac Asn		480
														ccc Pro 175		528
		Ala	Arg	Asp	Ala	Val		Ala	Phe	Lys	Ala			tgg Trp		576
														gcc Ala		624
														ccc Pro		672
														cag Gln		720
	_	_					ctc Leu		_	tga *						753

<210> 52 <211> 250

<212> PRT

<213> Artificial Sequence

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<220>
<223> Variant sequence produced by shuffling techniques
<400> 52
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
                            40
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
                                        75
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                    90
Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
                                105
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
                            120
                                                125
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
                        135
                                            140
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
                    150
                                        155
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
                165
                                    170
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
            180
                                185
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
        195
                            200
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala
                        215
Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln Leu
                    230
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
                245
<210> 53
<211> 753
<212> DNA
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1) ... (753)
<400> 53
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt
                                                                   48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
ggc tac tgc ggc acg acc gac gag tac tgc ggc gcc ggg tgc cag tcg
                                                                   96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser
             20
ggc ccg tgc cac tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gcg
                                                                   144
Gly Pro Cys His Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
```

35 40 45

aac gtg Asn Val 50															192
cag gcc Gln Ala 65		-		_			_						_		240
ttc ctg Phe Leu		-	_	_						_				_	288
cag gtg Gln Val	Gln (336
cat gag His Glu															384
gcc tac Ala Tyr 130															432
aag tac Lys Tyr 145			_		_	_	_	_	_						480
ggg ccc Gly Pro	_			_							_	_			528
agg gtg Arg Val	Ala														576
tgg atg Trp Met	Asn <i>1</i> 195	Asn	Val	His	Arg	Val 200	Met	Pro	Gln	Gly	Phe 205	Ğly	Āla	Thr	624
atc agg Ile Arg 210															672
cag atg Gln Met 225															720
ggc gtc Gly Val	_							_	tga *						753

<210> 54

<211> 250

<212> PRT

<213> Artificial Sequence

<220>

```
<223> Variant sequence produced by shuffling techniques
<400> 54
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser
                               25
Gly Pro Cys His Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
                           40
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn
                       55
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
                   70
                                       75
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                   90
Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
                               105
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
                           120
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
                       135
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Leu Ser Trp Asn Tyr Asn Tyr
                   150
                                       155
Gly Pro Ala Gly Arg Asp Ile Gly Phe Asn Gly Leu Ala Asp Pro Asn
               165
                                   170
Arg Val Ala Gln Asp Ala Val Ile Ala Phe Lys Ser Ala Leu Trp Phe
                               185
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
                           200
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala
                       215
                                           220
Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln Leu
                   230
                                       235
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
               245
<210> 55
<211> 753
<212> DNA
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1) ... (753)
<400> 55
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
ggc tac tgc ggc aca acc gac gag tac tgc ggc gac ggg tgc cag tcg
                                                                 96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
            20
144
Gly Pro Cys His Ser Gly Gly Gly Gly Gly Gly Gly Gly Ala
        35
```

aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag aac

Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn

50 55 60

				gly ggg												240
	_	_	_	gtc Val 85												288
cag Gln	gtg Val	cag Gln	ggc Gly 100	aag Lys	cgc Arg	gag Glu	atc Ile	gcc Ala 105	gcc Ala	ttc Phe	ttc Phe	gcg Ala	cat His 110	gtc Val	acg Thr	336
				cat His		_			_				_	_		384
_		_	_	ccg Pro		_		_		_	_	_	_		_	432
_				cgc Arg		_	_	_		_						480
				agg Arg 165	_							_	_			528
				gac Asp												576
	_			gtg Val		_	_	_	_	_				_		624
		_		aac Asn		-			_						_	672
_	_			cgc Arg					_	_		_	_			720
	_	_		999 Gly 245					_	tga *						753

<210> 56

<211> 250

<212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<400> 56

Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe 1 5 10 15 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser

```
Gly Pro Cys His Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Ala
                            40
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                    90
Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
                                105
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
                            120
                                                125
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
                        135
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
                    150
Gly Pro Ala Gly Arg Asp Ile Gly Phe Asn Gly Leu Ala Asp Pro Asn
Arg Val Ala Gln Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
                                185
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
                            200
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala
                        215
                                            220
Gln Met Asn Ala Arg Ile Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu
                    230
                                        235
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
                245
<210> 57
<211> 753
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1) ... (753)
<400> 57
tcg atg cag aat tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1
ggc tac tgc ggc acg acc gac gag tac tgc ggc gcc ggg tgc cag tcg
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser
             20
ggc ccg tgc cgc tcg ggc ggc ggc agc agt ggc ggc ggt ggt gcg
                                                                   144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag aac
                                                                   192
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn
     50
                         55
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg
                                                                   240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
 65
```

ttc ctg agc go Phe Leu Ser Al	-			_			
gag gtg gag cg Glu Val Glu Ar 10	g Lys Arg	Glu Ile					
cac gag acc gg His Glu Thr Gl 115							
gcc tac tgc ga Ala Tyr Cys As 130	_						
aag tac tac gg Lys Tyr Tyr Gl 145			-				
ggg ccc gcg gg Gly Pro Ala Gl							
agg gtg gcg cg Arg Val Ala An 18	g Asp Ala	Val Val					
tgg atg aac aa Trp Met Asn As 195						-	
atc cgg gcc at Ile Arg Ala Il 210							
tcc gtc aac aa Ser Val Asn As 225							ı
ggc gtc gac co Gly Val Asp Pr			_	_			753
<210> 58 <211> 250 <212> PRT <213> Artific	ial Seguen	ce					
<220> <223> Variant	sequence	produced	by shuft	fling te	chniques		
<400> 58							
Ser Met Gln As	sn Cys Gly 5	Cys Gln	Pro Asn 10	Val Cys	Cys Ser	Lys Phe	:
Gly Tyr Cys Gl)		25	_	30		
Gly Pro Cys Ai 35		40	_	_	45	_	
Asn Val Ala Se 50		55		60			
Gln Ala Gly Se	er Gly Cys	Glu Gly	Lys Asn	Phe Tyr	Thr Arg	Ser Ala	ı

```
70
Phe Leu Ser Ala Val Asn Ala Tyr Pro Gly Phe Ala His Gly Gly Thr
Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr
                              105
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
                           120
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
                       135
                                          140
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
145
                   150
                                      155
Gly Pro Ala Gly Gly Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
               165
                                  170
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
                              185
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asp Gly Lys Asn Pro Asn
                       215
Ser Val Asn Asn Arg Val Ala Tyr Tyr Arg Gln Tyr Cys Arg Gln Leu
                   230
                                      235
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
               245
<210> 59
<211> 771
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1)...(771)
<400> 59
teg atg cag aac tge gge tge cag eea aac tte tge tge age aag ttt
                                                               48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
gge tae tge gge aeg aee gae gee tae tge gge gae ggg tge eag teg
                                                               96
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
            20
144
35
gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg ttc
                                                               192
Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala Phe
     50
ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag aac
                                                               240
Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn
 65
                    70
tte tae ace egg age geg tte etg age gee gte aag geg tae eea gge
                                                               288
Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly
                85
ttc gcc cat ggc ggg tca cag gtg cag ggc aag cgc gag att gcc gcc
                                                               336
Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala
```

100	105	110

								cat His					384
		_	_	_		_	_	ccg Pro		_	 _		432
								cgc Arg 155					480
_								agg Arg	_			_	528
		_		 				gac Asp	_		 		576
_	 				_			gtg Val		_	 _	_	624
								aac Asn					672
								cgc Arg 235					720
_	_	_	_		_	_		Gly 999				_	768
tga *													771

<210> 60

<211> 256

<212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<400> 60

Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala Phe 50 55 60

Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn 65 70 75 80 Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly

```
Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala
Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser
Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp
                      135
Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile
                   150
                                     155
Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp
               165
                                  170
Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe
                              185
Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro
                          200
Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys
                      215
Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg
                                     235
Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
<210> 61
<211> 771
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1)...(771)
<400> 61
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc
                                                              48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg
                                                              96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
            20
                                                  30
144
35
gga ggc agt ggc ggt gcg aac gtg gct agc gtc acc ggc tcc ttc
                                                              192
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe
     50
ttc aac ggc atc aag agc cag gcc ggg agc ggg tgc gag ggc aag aac
Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn
 65
ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc
                                                              288
Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly
                85
tte gee cat gge gge tee gag gte gag ege aag ege gag att gee gee
                                                              336
Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala Ala
```

	Ala Thr His G		ttc tgc tac atc Phe Cys Tyr Ile 125	
-	_		acc aag agg cag Thr Lys Arg Gln 140	
			ggc ccg ctg cag Gly Pro Leu Gln	
	555	5 5 555 55	gcc atc ggc ttc Ala Ile Gly Phe 175	_
			gcc gtg gtg gcg Ala Val Val Ala 190	
0 0 0 0	Trp Phe Trp M		cac cgt gtg atg His Arg Val Met 205	_
	-		ggc gcg ctc gag Gly Ala Leu Glu 220	_
			gtc ggc tac tac Val Gly Tyr Tyr	_
			ccc aac ctc act Pro Asn Leu Thr 255	
tga *				771
<210> 62 <211> 256 <212> PRT <213> Artificial	l Sequence			
<220> <223> Variant se	equence produc	ced by shufflin	g techniques	
<400> 62 Ser Met Gln Asn 1	Cys Gly Cys G	Gln Pro Asn Val 10	. Cys Cys Ser Lys 15	Phe
	•	= -	Asp Gly Cys Gln	Ser
Gly Pro Cys Arg 35		Gly Gly Gly Gly 40	Gly Gly Gly Gly	Gly
50	55		. Val Thr Gly Ser	
65	70	75	Cys Glu Gly Lys	80
	85	90	Lys Ala Tyr Pro	-
rne Ala His Gly	GIY Ser Glu V	val Glu Arg Lys	: Arg Glu Ile Ala	Ala

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Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile Asn
Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp
                      135
Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile
                   150
                                      155
Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp
               165
                                  170
Gly Leu Ala Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe
                              185
Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro
                          200
                                             205
Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys
                      215
Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys
225
                   230
                                      235
Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
<210> 63
<211> 774
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1)...(774)
<400> 63
teg atg cag aac tgc ggc tgc cag cca aac ttc tgc tgc agc aag ttc
                                                               48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
                                   10
ggc tac tgc ggc aca acc gac gag tac tgc ggc gac ggg tgc cag tcg
                                                               96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
            20
                                                  30
144
35
ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg
                                                               192
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
    50
                        55
tto tto aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag
                                                               240
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
 65
                    70
aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca
                                                               288
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro
ggc ttc gcc cat ggc ggg tca cag gtg cag ggc aag cgc gag atc gcc
                                                               336
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala
           100
                              105
gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc
                                                               384
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
```

115 120 125

_				_	_		gcc Ala		_	_	_		_		_	432
	_	_	_			_	aag Lys				_		_	_	_	480
_	_						gjà aaa		_			_				528
			_	_			agg Arg				_			_		576
	_						tgg Trp 200	_					_		_	624
_	_				_		atc Ile		_				_		_	672
_						_	cag Gln	_	_		_	_				720
_	_		_	-	_		ggc Gly	_	_							768
tgc Cys	tga *															774

<210> 64

<211> 257

<212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<400> 64

 Ser Met
 Gln
 Asn
 Cys
 Gly
 Cys
 Gln
 Pro
 Asn
 Phe
 Cys
 Cys
 Ser
 Lys
 Phe

 1
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 6
 10
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 7
 15
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65 70 75 80
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro

85 90 95
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala

```
100
                              105
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
                          120
                                             125
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
                      135
                                         140
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
                   150
                                      155
Leu Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Asp Ile Gly Phe
               165
                                  170
                                                     175
Asn Gly Leu Ala Asp Pro Asn Arg Val Ala Arg Asp Pro Val Leu Ala
                              185
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met
                          200
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Lys
                      215
Cys Gly Gly Asn Asn Pro Ala Gln Met Asp Ala Arg Val Gly Tyr Tyr
                   230
                                      235
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
                                  250
Cys
<210> 65
<211> 774
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1)...(774)
<400> 65
teg atg cag aac tge gge tge cag eea aac gta tge tge age aag ttt
                                                               48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
gge tac tge gge acg ace gac gag tac tge gge gac ggg tge cag teg
                                                               96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
            20
144
35
ggc gga ggc agt ggt ggt gcg aac gtg gct agc gtc gtc acc gac tcc
                                                               192
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Asp Ser
     50
ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag
                                                               240
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
 65
aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca
                                                               288
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro
                                                      95
ggc ttc gcc cat ggc ggg tcg cag gtg cag ggc aag cgc gag atc gcc
                                                               336
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala
```

```
gcc ttc ttc gcg cat gtc acg cac gag acc ggg cat ttc tgc tac atc
                                                                 384
Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile
                           120
age gag ate aae aag age aae gee tae tge gae eeg aee aag agg eag
                                                                 432
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
                       135
tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgt ggc ccg ctg cag
                                                                 480
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
                   150
                                       155
ate teg tgg aac tac aac tac ggg eec geg ggg agg gee ate gge tte
                                                                 528
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
               165
                                   170
gac ggg ctc gcc gac ccc aac agg gtg gcg cag gac gcc gtg gtg gcg
                                                                 576
Asp Gly Leu Ala Asp Pro Asn Arg Val Ala Gln Asp Ala Val Val Ala
            180
                               185
                                                   190
ttc aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg
                                                                 624
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arq Val Met
        195
                           200
ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag
                                                                 672
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu
    210
                       215
tge gge ggg aac aac eec gee eag atg aac geg ege gte gge tac tac
                                                                 720
Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
225
                   230
aag cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act
                                                                 768
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
               245
tgc tga
                                                                 774
Cys *
<210> 66
<211> 257
<212> PRT
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<400> 66
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
                                   10
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
                               25
40
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Asp Ser
                       55
                                           60
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
                                       75
```

Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro 85 Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala 105 Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln 135 Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln 150 155 Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe 170 175 165 Asp Gly Leu Ala Asp Pro Asn Arg Val Ala Gln Asp Ala Val Val Ala 185 Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met 200 205 Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu 215 220 Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr 230 235 Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr 250 Cys

<210> 67
<211> 765
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1)...(765)

20

<400> 67
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc 48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
1 5 10 15

ggc tac tgc ggc aca acc gac gag tac tgc ggc gac ggg tgc cag tcg 96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser

25

agt ggt ggt gcg aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac 192 Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn 50 55 60

ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac 240 Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr 65 70 75 80

acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc 288
Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala
85 90 95

cat ggc ggg tca cag gtg cag ggc aag cgc gag att gcc gcc ttc ttc 336

```
His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe
           100
                               105
geg cac gec acg cac gag acc ggg cat ttc tgc tac atc agc gag atc
                                                                 384
Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile
                           120
aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc
                                                                 432
Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys
                       135
                                                                 480
gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag atc tcg tgg
Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp
                                       155
                   150
aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc
                                                                 528
Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu
               165
                                   170
ggg gac ccc aac agg gtg gcg cag gac gcc gtg gtg gcg ttc aag gcg
                                                                 576
Gly Asp Pro Asn Arq Val Ala Gln Asp Ala Val Val Ala Phe Lys Ala
                               185
gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg ccg cag ggc
                                                                 624
Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly
        195
                           200
ttc ggc gcc acc atc agg gcc atc aac ggc gcg ctc gag tgc gac ggg
                                                                 672
Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asp Gly
    210
                       215
aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac aag cag tac
                                                                 720
Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr
                                       235
225
                   230
tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act tgc tga
                                                                 765
Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
                245
<210> 68
<211> 254
<212> PRT
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
40
Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn
Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr
                                       75
Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala
                                   90
His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe
```

10 Ala His Ala Th		Thr Glv	105 His Dhe	Cve Tvr	Tle	110	Glu	Tle	
115		120			125				
Asn Lys Ser Ass		135		140					
Ala Ala Gly Gl: 145	т Lys Туг 15(Arg Gly	155	GIN	ше	ser	160	
Asn Tyr Asn Ty	Gly Pro	Ala Gly	Arg Ala 170	_	Phe	Asp	Gly 175	Leu	
Gly Asp Pro As:	_	l Ala Gln	Asp Ala 185	Val Val	Ala	Phe 190	Lys	Ala	
Ala Leu Trp Ph 195	Trp Met	Asn Asn 200		Arg Val	Met 205	Pro	Gln	Gly	
Phe Gly Ala Th 210	Ile Arg	g Ala Ile 215	Asn Gly	Ala Leu 220	Glu	Cys	Asp	Gly	
Asn Asn Pro Al 225	a Gln Met 230		Arg Val	Gly Tyr 235	Tyr	Lys	Gln	Tyr 240	
Cys Arg Gln Le	u Gly Va: 245	l Asp Pro	Gly Pro 250	*	Thr	Cys			
<210> 69 <211> 753									
<212> DNA	_								
<213> Artifici	al Sequei	nce							
<220> <223> Variant	sequence	produced	by shuf	fling te	chnic	ques			
<221> CDS <222> (1)(7	53)								
<400> 69									
tcg atg cag aa					_	_	_		48
Ser Met Gln As	5 5	y Cys Gin	10 ASI	-	Сув	ser	15	PHE	
ggc tac tgc gg			_			_	_	_	96
Gly Tyr Cys Gl 2		r Asp Glu	25	GIY ASP	GIY	30	GIN	ser	
ggc ccg tgc cg									144
Gly Pro Cys Ar 35	g Ser Gi	y Gly Gly 40	_	Ser Gly	45	GIY	GIY	Ala	
aac gtg gct ag	_						_		192
Asn Val Ala Se 50	r vai va	55	ser Pne	Pne Asn 60	GIÀ	11e	ьуs	Asn	
cag gcc ggg ag									240
Gln Ala Gly Se						$\Lambda \sim \alpha$	Ser	Ala	
65	r Gly Cya	_	Lys Asn	75	Thr	Arg	DCI	80	
ttc ctg agc gc	7 c gtc aa	g gcg tac	cca ggc	75 ttc gcc	cat	ggc	999	80 tca	288
	7 c gtc aa	g gcg tac	cca ggc	75 ttc gcc Phe Ala	cat	ggc	999	80 tca	288
ttc ctg agc gc Phe Leu Ser Al cag gtg cag gg	70 c gtc aag a Val Lys 85 c aag cg	g gcg tac s Ala Tyr c gag atc	cca ggc Pro Gly 90	75 ttc gcc Phe Ala	cat His	ggc Gly cac	ggg Gly 95 gcc	80 tca Ser acg	288
ttc ctg agc gc Phe Leu Ser Al	o gtc aag a Val Lys 85 c aag cg y Lys Arg	g gcg tac s Ala Tyr c gag atc	cca ggc Pro Gly 90	75 ttc gcc Phe Ala	cat His	ggc Gly cac	ggg Gly 95 gcc	80 tca Ser acg	
ttc ctg agc gc Phe Leu Ser Al cag gtg cag gg Gln Val Gln Gl	gtc aag a Val Lys 85 c aag cg y Lys Arg	g gcg tac s Ala Tyr c gag atc g Glu Ile	c cca ggc Pro Gly 90 gcc gcc Ala Ala	75 ttc gcc Phe Ala	cat His gcg Ala	ggc Gly cac His	ggg Gly 95 gcc Ala	80 tca Ser acg Thr	

_	tac Tyr 130	_	_	_		_		_		_	_	_			_	432
_	tac Tyr			_		_	_	_		_						480
	ccc Pro				_				_				_			528
	gtg Val															576
	atg Met					_		_	_	_				_		624
	agg Arg 210															672
	atg Met															720
	gtc Val	_							_	tga *						753

<210> 70

<211> 250

<212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala 40 Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala 75 Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser 90 Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr

100 105 110

His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Ser Lys Ser Asn 115 120 125

Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln 135 140 Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr

155 Gly Pro Ala Gly Arg Asp Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly 170 Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asp Gly Asn Asn Pro Ala 215 220 Gln Met Asn Ala Arg Ile Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu 230 235 Gly Val Asp Pro Gly Pro Asn Leu Thr Cys 245 <210> 71 <211> 774 <212> DNA <213> Artificial Sequence <220> <223> Variant sequence produced by shuffling techniques <221> CDS <222> (1) ... (774) <400> 71 tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc 48 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe 10 ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg 96 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser 20 30 144 35 40 ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg 192 Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Thr Asp Ala 50 55 60 ttc ttc aac ggc atc aag agc cag gcc ggg agc ggg tgc gag ggc aag 240 Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys 65 70 75 aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro 85 ggc ttc gcc cat ggc ggg tca cag gtg cag ggc aag cgc gag atc gcc 336 Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc 384 Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile 115 age gag ate aac aag age aac gee tae tge gae eeg ace aag agg cag 432 Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln 130

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tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag
                                                                480
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
145
                   150
atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc
                                                                528
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
gac ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg
                                                                576
Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala
           180
ttc aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg
                                                                624
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met
       195
                           200
ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcg ctc gag
                                                                 672
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu
   210
tgc gac ggg aac aac ccc gcc cag atg aac gcg cgc atc ggc tac tac
Cys Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Ile Gly Tyr Tyr
225
aag cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act
                                                                 768
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
               245
tqc tqa
                                                                 774
Cys *
<210> 72
<211> 257
<212> PRT
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
                       55
Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys
                                       75
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
                           120
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
                       135
                                           140
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
                                       155
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
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Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala 185 Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met 200 Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu 215 Cys Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Ile Gly Tyr Tyr 235 Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr 250 Cys <210> 73 <211> 771 <212> DNA <213> Artificial Sequence <220> <223> Variant sequence produced by shuffling techniques <221> CDS <222> (1) ... (771) <400> 73 teg atg cag aac tge gge tge cag eea aac gta tge tge age aag tte 48 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe 10 ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg 96 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser 20 25 144 35 40 gga ggc agt ggc ggt gcg aac gtg gct agc gtc gtc acc gac tcc ttc 192 Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Asp Ser Phe 50 55 60 ttc aac ggc atc aag agc cag gcc ggg agc ggg tgc gag ggc aag aac 240 Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn 65 70 75 ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc 288 Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly 85 tte gee cat gge ggg teg eag gtg eag gge aag ege gag ate gee gee Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala ttc ttc gcg cat gtc acg cac gag acc ggg cat ttc tgc tac atc aac 384 Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Asn 115 gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg 432 Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp 130

```
ccg tgc gcc gcg ggg cag agg tac tac ggg cgt ggc ccg ctg cag atc
                                                                480
Pro Cys Ala Ala Gly Gln Arg Tyr Tyr Gly Arg Gly Pro Leu Gln Ile
teg tgg aac tac aac tac ggg eec geg ggg agg gee ate gge tte gac
                                                                528
Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp
ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg ttc
                                                                576
Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe
           180
aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg ccg
                                                                624
Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro
       195
cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc qaq tqc
                                                                672
Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys
   210
                       215
gac ggg aac aac ccc gcc caq atq aac gcg cqc atc ggc tac tac aaq
                                                                720
Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Ile Gly Tyr Tyr Lys
cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act tgc
                                                                768
Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
               245
tga
                                                                771
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<211> 256
<212> PRT
<213> Artificial Sequence
<220>
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Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
40
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Asp Ser Phe
Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn
                   70
Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly
Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala
                               105
Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Asn
                           120
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140

Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp

Pro Cys Ala Ala Gly Gln Arg Tyr Tyr Gly Arg Gly Pro Leu Gln Ile

Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp

			165					170					175		
Gly Leu	_	Asp 180	Pro	Gly	Arg	Val	Ala 185	Arg	Asp	Ala	Val	Val 190	Ala	Phe	
Lys Ala	Ala I 195	Leu	Trp	Phe	Trp	Met 200	Asn	Asn	Val	His	Arg 205	Val	Met	Pro	
Gln Gly 210	Phe C	Gly	Ala	Thr	Ile 215	Arg	Ala	Ile	Asn	Gly 220	Ala	Leu	Glu	Cys	
Asp Gly 225	Asn A	Asn	Pro	Ala 230	Gln	Met	Asn	Ala	Arg 235	Ile	Gly	Tyr	Tyr	Lys 240	
Gln Tyr	Cys A	Arg	Gln 245	Leu	Gly	Val	Asp	Pro 250	Gly	Pro	Asn	Leu	Thr 255		
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<220> <223> Variant sequence produced by shuffling techniques															
<221> C <222> ((780))												
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tcg atg Ser Met															48
1			5					10					15		
ggc tac Gly Tyr															96
		20					25					30			
ggc ccg Gly Pro	Cys 2										Gly				144
	35					40					45				
ggc gga Gly Gly	Gly :				Gly					Ala					192
50					55					60					
ggc tcc Gly Ser				Gly					Ala					Glu	240
65				70					75					80	
ggc aag Gly Lys			Tyr					Phe					Lys		288
		.	85				•	90					95		226
tac cca Tyr Pro	Gly I	Phe					Ser					Lys			336
		100					105					110			
atc gcc Ile Ala	Ala					Val	_				Gly			_	384
	115					120					125				
tac atc	Ser			-	Lys	_		_		Cys	_	_		_	432
130					135					140					
agg cag Arg Gln							_	_				-		-	480

150 155 145 160 ctg cag atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc 528 Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile ggc ttc gac ggg ctc ggg gac ccc aac agg gtg gcg cgg gac ccc gtg 576 Gly Phe Asp Gly Leu Gly Asp Pro Asn Arg Val Ala Arg Asp Pro Val 180 ctg gcg ttc aag gcg gcg ctc tgg ttc tgg atg aac agc gtg cac ggg 624 Leu Ala Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly 195 gtg gtg ccg cag ggg ttc ggc gcc acc acc agg gcc atc aac ggc gcc 672 Val Val Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala ctc gag tgc aac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc 720 Leu Glu Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly tac tac agg cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac 768 Tyr Tyr Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn 245 250 ctc act tgc tga 780 Leu Thr Cys * <210> 76 <211> 259 <212> PRT <213> Artificial Sequence <223> Variant sequence produced by shuffling techniques Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser Gly Gly Ser Gly Gly Gly Val Asn Val Ala Ser Ile Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu 75 Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala 90 Tyr Pro Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu 105 Ile Ala Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys 120 Tyr Ile Ser Glu Ile Ser Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys 135 140 Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro

170

Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile

Gly Phe Asp Gly Leu Gly Asp Pro Asn Arg Val Ala Arg Asp Pro Val

155

150

Leu Ala Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly 200 Val Val Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala 215 Leu Glu Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly 230 235 Tyr Tyr Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn 250 Leu Thr Cys <210> 77 <211> 753 <212> DNA <213> Artificial Sequence <220> <223> Variant sequence produced by shuffling techniques <221> CDS <222> (1) ... (753) <400> 77 tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc 48 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe 10 ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg 96 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser 20 25 ggc ccg tgc cac tcg ggc ggc ggc agc agt ggc ggc ggt ggt gtg 144 Gly Pro Cys His Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Val 40 aac gtg gcc agc atc gtg acc ggc tcc ttc ttc aac ggc atc aag aac 192 Asn Val Ala Ser Ile Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn 50 55 cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg 240 Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala 65 70 tto ctg ago goo gto aag gog tao coa ggo tto goo cat ggo ggg acg 288 Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Thr 85 gag gtg gag ggc aag cgc gag att gcc gcc ttc ttc gcg cac gcc acg 336 Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr 100 cac gag acc ggg cat ttc tgc tac atc agc gag atc agc aag agc aac 384 His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Ser Lys Ser Asn 115 gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag 432 Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln 130 aag tac tac gga cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac 480 Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr

145	150	155	160								
ggg ccc gcg ggg agg Gly Pro Ala Gly Arg 165											
agg gtg gcg cgg gac Arg Val Ala Arg Asp 180	Ala Val Val										
tgg atg aac agc gtg Trp Met Asn Ser Val 195			e Gly Ala Thr								
atc agg gcc atc aac Ile Arg Ala Ile Asn 210											
cag atg aac gcg cgc Gln Met Asn Ala Arg 225		2 2	2 2								
ggc gtc gac cca ggg Gly Val Asp Pro Gly 245			753								
<210> 78 <211> 250 <212> PRT <213> Artificial Sequence											
<213> Artificial Se	quence										
<213> Artificial Se <220> <223> Variant seque		by shuffling tech	iques								
<220> <223> Variant seque <400> 78 Ser Met Gln Asn Cys	nce produced	Pro Asn Val Cys Cy	s Ser Lys Phe								
<220> <223> Variant seque <400> 78 Ser Met Gln Asn Cys 1 5 Gly Tyr Cys Gly Thr	nce produced Gly Cys Gln	Pro Asn Val Cys Cy 10 Tyr Cys Gly Asp G	rs Ser Lys Phe 15 y Cys Gln Ser								
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<220> <223> Variant seque <400> 78 Ser Met Gln Asn Cys 1 5 Gly Tyr Cys Gly Thr 20 Gly Pro Cys His Ser 35 Asn Val Ala Ser Ile 50 Gln Ala Gly Ser Gly 65 Phe Leu Ser Ala Val	Gly Cys Gln Thr Asp Glu Gly Gly Gly 40 Val Thr Gly 55 Cys Glu Gly 70 Lys Ala Tyr	Pro Asn Val Cys Cy 10 Tyr Cys Gly Asp Gi 25 Gly Ser Ser Gly Gi 49 Ser Phe Phe Asn Gi 60 Lys Asn Phe Tyr Ti 75 Pro Gly Phe Ala Hi	rs Ser Lys Phe 15 y Cys Gln Ser 30 y Gly Gly Val y Ile Lys Asn ar Arg Ser Ala 80 s Gly Gly Thr								
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<pre><220> <223> Variant seque <400> 78 Ser Met Gln Asn Cys 1</pre>	Gly Cys Gln Thr Asp Glu Gly Gly Gly 40 Val Thr Gly 55 Cys Glu Gly 70 Lys Ala Tyr Arg Glu Ile Phe Cys Tyr 120 Thr Lys Arg 135 Gly Pro Leu 150	Pro Asn Val Cys Cy 10 Tyr Cys Gly Asp Gl 25 Gly Ser Ser Gly Gl Ser Phe Phe Asn Gl 60 Lys Asn Phe Tyr Tl 75 Pro Gly Phe Ala H: 90 Ala Ala Phe Phe A: 105 Ile Ser Glu Ile Ser 140 Gln Trp Pro Cys A: 140 Gln Ile Ser Trp A: 155	rs Ser Lys Phe 15 y Cys Gln Ser 30 y Gly Gly Val y Ile Lys Asn ar Arg Ser Ala 80 s Gly Gly Thr 95 a His Ala Thr 110 ar Lys Ser Asn 5 a Ala Gly Gln 6 fn Tyr Asn Tyr 160								
<pre><220> <223> Variant seque <400> 78 Ser Met Gln Asn Cys 1</pre>	Gly Cys Gln Thr Asp Glu Gly Gly Gly 40 Val Thr Gly 55 Cys Glu Gly 70 Lys Ala Tyr Arg Glu Ile Phe Cys Tyr 120 Thr Lys Arg 135 Gly Pro Leu 150 Ala Ile Gly	Pro Asn Val Cys Cy 10 Tyr Cys Gly Asp Gi 25 Gly Ser Ser Gly Gi 49 Ser Phe Phe Asn Gi 60 Lys Asn Phe Tyr Ti 75 Pro Gly Phe Ala Hi 90 Ala Ala Phe Phe Ai 105 Ile Ser Glu Ile Ser 11 Gln Trp Pro Cys Ai 140 Gln Ile Ser Trp As 155 Phe Asp Gly Leu Gi 170	rs Ser Lys Phe 15 y Cys Gln Ser 30 y Gly Gly Val y Ile Lys Asn ar Arg Ser Ala 80 s Gly Gly Thr 95 a His Ala Thr 110 ar Lys Ser Asn 5 a Ala Gly Gln an Tyr Asn Tyr 160 y Asp Pro Asn								
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210 Gln Met Asn Ala 225 Gly Val Asp Pro	230		235 s	Arg Gln	Leu 240								
<210> 79 <211> 750 <212> DNA <213> Artificial Sequence													
<220> <223> Variant sequence produced by shuffling techniques													
<221> CDS <222> (1)(750)													
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ggc tac tgc ggc Gly Tyr Cys Gly 20													
ggc ccg tgc cac Gly Pro Cys His 35				Gly Ala									
gtg gct agc gtc Val Ala Ser Val 50		Ser Phe Ph			_								
gcc ggg agc ggg Ala Gly Ser Gly 65													
ctg agc gcc gtc Leu Ser Ala Val		Pro Gly Ph			_								
gtg cag ggc aag Val Gln Gly Lys 100													
gag acc ggg cat Glu Thr Gly His 115				Ser Asn									
tac tgc gac ccg Tyr Cys Asp Pro 130		Gln Trp Pr											
tac tac ggg cgc Tyr Tyr Gly Arg 145		-											
ccc gcg ggg agg Pro Ala Gly Arg			y Leu Ala As										

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gtg gcg cag gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg ttc tgg
                                                                   576
Val Ala Gln Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe Trp
            180
atg aac aac gtg cac cgt gtg atg ccg cag ggc ttc ggc gcc acc atc
                                                                   624
Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr Ile
        195
agg gcc atc aac ggc gcg ctc gag tgc gac ggg aac aac ccc gcc cag
                                                                   672
Arg Ala Ile Asn Gly Ala Leu Glu Cys Asp Gly Asn Asn Pro Ala Gln
    210
                        215
atg aac gcg cgc gtc ggc tac tac aag cag tac tgc cgc cag ctc ggc
                                                                   720
Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu Gly
                    230
gtc gac cca ggg ccc aac ctc act tgc tga
                                                                   750
Val Asp Pro Gly Pro Asn Leu Thr Cys *
                245
<210> 80
<211> 249
<212> PRT
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser
            20
Gly Pro Cys His Ser Gly Gly Gly Gly Ser Gly Gly Gly Ala Asn
                            40
Val Ala Ser Val Val Thr Asp Ser Phe Phe Asn Gly Ile Lys Ser Gln
                        55
Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe
Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser Gln
                                    90
Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr His
                                105
Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala
                            120
Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys
                        135
Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly
                                        155
Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Ala Asp Pro Asn Arg
                                    170
Val Ala Gln Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe Trp
                                185
Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr Ile
        195
                            200
Arg Ala Ile Asn Gly Ala Leu Glu Cys Asp Gly Asn Asn Pro Ala Gln
                        215
                                            220
Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu Gly
                    230
                                        235
Val Asp Pro Gly Pro Asn Leu Thr Cys
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<210> 81
<211> 753
<212> DNA
<213> Artificial Sequence
<220>
<223> Variant sequence produced by shuffling techniques
<221> CDS
<222> (1) ... (753)
<400> 81
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Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg
                                                                   96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
gge eeg tge eac teg gge gge gge age agt gge gge ggt ggt geg
                                                                   144
Gly Pro Cys His Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
                             40
aat gtg gct aat gtg gtc acc gac gcg ttc ttc aac ggc atc aag aac
                                                                   192
Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn Gly Ile Lys Asn
                         55
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg
                                                                   240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
                     70
                                         75
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggg tcg
                                                                   288
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                     90
cag gtg cag ggc aag cgc gag att gcc gcc ttc ttc gcg cat gcc acg
                                                                   336
Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr
            100
                                105
cac gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac
                                                                   384
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
                            120
gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag
                                                                   432
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
                        135
aag tac tac ggg cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc ggg gac ccc ggc
                                                                   528
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
                                     170
agg gtg gcg cgg gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg ttc
                                                                   576
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
                                185
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tgg atg aac aac gtg cac cgt gtg atg ccg cag ggg ttc ggt gcc acc

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Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
atc egg gee atc aac gge gee etc gag tge gge ggg aac aac eec gee
                                                                   672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala
                        215
                                            220
cag atg aac gcg cgc atc ggc tac tac aag cag tac tgc cqc caq ctc
                                                                   720
Gln Met Asn Ala Arg Ile Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu
ggc gtc gac cca ggg ccc aac ctc act tgc tga
                                                                   753
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
                245
<210> 82
<211> 250
<212> PRT
<213> Artificial Sequence
<223> Variant sequence produced by shuffling techniques
<400> 82
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
                                25
Gly Pro Cys His Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala
                            40
Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn Gly Ile Lys Asn
                        55
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
                    70
                                        75
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
                                    90
Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr
            100
                                105
                                                     110
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
                            120
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
                        135
                                            140
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
                    150
                                        155
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
                165
                                    170
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
            180
                                185
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
                            200
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala
                        215
Gln Met Asn Ala Arg Ile Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu
                    230
                                        235
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
                245
<210> 83
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<211> 771

<212> DNA

<213> Artificial Sequence

<220> <223> Variant sequence produced by shuffling techniques <221> CDS <222> (1) ... (771) <400> 83 teg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc 48 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe gge tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg 96 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser gga ggc agt ggt ggt gcq aac gtg gct agc gtc gtc acc ggc tcc ttc 192 Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe 50 ttc aac ggc atc aag agc cag gcc ggg agc ggg tgc gag ggc aag aac 240 Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc 288 Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly tte gee cat gge ggg teg cag gtg cag gge aag ege gag ate gee gee 336 Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala 100 105 ttc ttc gcg cat gtc acg cac gag acc ggg cat ttc tgc tac atc agc 384 Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser 120 gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg 432 Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp 135 140 ccg tgc gcc gcg ggg cag aag tac tac ggg cgt ggc ccg ctg cag atc 480 Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile 150 tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttt gac 528 Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp 165 ggg ctc gcc gac ccc aac agg gtg gcg cag gac gcc gtg gtg gcg ttc Gly Leu Ala Asp Pro Asn Arg Val Ala Gln Asp Ala Val Val Ala Phe aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg ccg 624 Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag tgc 672 Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys

gge ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac agg 720 Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg 230 235 cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act tgc 768 Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys 245 250 771 tga

<210> 84 <211> 256 <212> PRT <213> Artificial Sequence

<223> Variant sequence produced by shuffling techniques

<400> 84

Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser 25 Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn 70 Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly 90 Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala 100 105 Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser 120 Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp 135 Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile 150 Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp 170 Gly Leu Ala Asp Pro Asn Arg Val Ala Gln Asp Ala Val Val Ala Phe 185 190 Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro 200 Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys 215 220 Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg 235 230 Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys 245 250